

PATENT
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	:	Docket: ACM 3029 P1US
Peter Marten VAN DER HORST	:	
	:	Group Art Unit: 1791
Serial No.: 10/584,005	:	
	:	Examiner: Dennis R. Cordray
Int'l Application No.: PCT/EP2004/014737	:	
Int'l Filing Date: December 21, 2004	:	Confirmation Number: 8565
	:	
For: PAPER COMPRISING QUATERNARY	:	
NITROGEN CONTAINING CELLULOSE ETHER	:	

Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

RESPONSE UNDER 37 C.F.R. § 1.111

Sir:

In response to the Official Action mailed April 19, 2010, and in accordance with the provisions of 37 C.F.R. § 1.111, Applicants provide the following amendments and remarks for entry in the present case.

Listing of the Claims begin on page 2 of this paper.

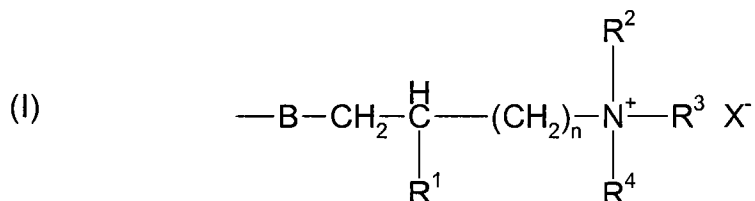
Remarks/Arguments begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims is provided solely for the convenience of the Examiner. No amendments to the claims have been made in this Response.

1. (previously presented) A paper comprising a filler content of above 20 wt% based on the total weight of the paper and a cellulose ether, said cellulose ether having a DS of quaternary ammonium groups of between 0.01 and 0.7, a DS of carboxymethyl groups of between 0.05 and 1.0, and a net charge in the range of from -0.7 to -0.04, with the proviso that the cellulose ether is not a hydroxyethyl cellulose and wherein the cellulose ether is soluble in water.

2. (previously presented) The paper according to claim 1 wherein the quaternary ammonium groups are represented by the formula:

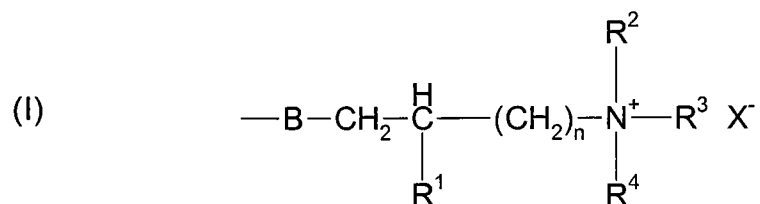


wherein R¹ is H or OH, R², R³, and R⁴ are the same or different and are selected from C₁-C₂₄ alkyl, C₆-C₂₄ aryl, C₇-C₂₄ aralkyl, C₇-C₂₄ alkaryl, C₃-C₂₄ cycloalkyl, C₂-C₂₄ alkoxyalkyl, and C₇-C₂₄ alkoxyaryl groups, or R², R³, R⁴, and the quaternary nitrogen atom form an aliphatic or aromatic heterocyclic ring; n is an integer of 1 to 4, B is attached to the backbone of the cellulose ether and selected from O, OC(O), C(O)O, C(O)-NH, NHC(O), S, OSO₃, OPO₃, NH, or NR⁵, wherein R⁵ is a C₂-C₆ acyl or a C₁-C₄ alkyl radical, and X⁻ is an anion.

3. (canceled)

4. (canceled)

5. (currently amended) A paper coating comprising cellulose ether wherein the cellulose ether has a DS of quaternary ammonium groups of between 0.01 and 0.7, a DS of carboxymethyl groups of between 0.05 and 1.0, and a net charge in the range of from -0.7 to -0.04 and wherein the cellulose ether is soluble in water.
6. (canceled)
7. (canceled)
8. (previously presented) The paper coating according to claim 5 wherein said cellulose ether is not a hydroxyethyl cellulose.
9. (previously presented) The paper coating according to claim 8 wherein the quaternary ammonium groups are represented by the formula:

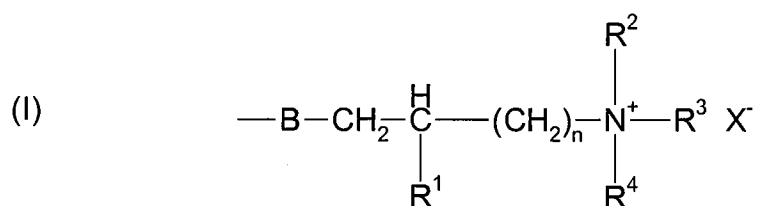


wherein R¹ is H or OH, R², R³, and R⁴ are the same or different and are selected from C₁-C₂₄ alkyl, C₆-C₂₄ aryl, C₇-C₂₄ aralkyl, C₇-C₂₄ alkaryl, C₃-C₂₄ cycloalkyl, C₂-C₂₄ alkoxyalkyl, and C₇-C₂₄ alkoxyaryl groups, or R², R³, R⁴, and the quaternary nitrogen atom form an aliphatic or aromatic heterocyclic ring; n is an integer of 1 to 4, B is attached to the backbone of the cellulose ether and selected from O, OC(O), C(O)O, C(O)-NH, NHC(O), S, OSO₃, OPO₃, NH, or NR⁵, wherein R⁵ is a C₂-C₆ acyl or a C₁-C₄ alkyl radical, and X⁻ is an anion.

10. (canceled)
11. (canceled)

12. (previously presented) A method of making paper comprising:
 adding the cellulose ether of claim 1 to an aqueous paper stock
 adding a filler to said stock;
 removing water from said stock; and
 drying said stock;
 wherein the paper has a filler content above 20 wt% based on the total weight of the paper.

13. (previously presented) The method of claim 12 wherein said quaternary ammonium groups are represented by the formula:



wherein R¹ is H or OH, R², R³, and R⁴ are the same or different and are selected from C₁-C₂₄ alkyl, C₆-C₂₄ aryl, C₇-C₂₄ aralkyl, C₇-C₂₄ alkaryl, C₃-C₂₄ cycloalkyl, C₂-C₂₄ alkoxyalkyl, and C₇-C₂₄ alkoxyaryl groups, or R², R³, R⁴, and the quaternary nitrogen atom form an aliphatic or aromatic heterocyclic ring; n is an integer of 1 to 4, B is attached to the backbone of the cellulose ether and selected from O, OC(O), C(O)O, C(O)-NH, NHC(O), S, OSO₃, OPO₃, NH, or NR⁵, wherein R⁵ is a C₂-C₆ acyl or a C₁-C₄ alkyl radical, and X⁻ is an anion.

14. (previously presented) The paper according to claim 1 wherein the paper has a filler content above 25 wt% based on the total weight of the paper.

15. (previously presented) The method of claim 12 wherein the paper has a filler content above 25 wt% based on the total weight of the paper.

Remarks/Arguments

Claims 1, 2, 5, 8, 9, and 12-15 are pending in the application.

Response to Rejections based on Matsuda in view of Hosokawa as evidenced by Watanabe

Claims 1, 2, 5, 8, 9 and 14 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,616,409 ("Matsuda") in view of JP 2002-201202A ("Hosokawa") and as evidenced by U.S. Patent No. 5,989,391 ("Watanabe"). The Office asserts that Matsuda discloses an ink jet recording medium comprising a paper substrate having a basis weight from 50 to 100 g/m² and containing from 5 to 30 percent by weight of a filler and retention aids. (Office Action, page 3). Further, the Office alleges that Matsuda discloses that its paper comprises a coating in an amount of 2 to 10 g/m² on at least one surface, the coating comprising a white pigment and a binder such as carboxymethylcellulose. (Office Action, page 3). However, the Office acknowledges that Matsuda fails to disclose the claimed cellulose ether.

To provide this missing feature, the Office seeks to combine Matsuda with Hosokawa. The Office alleges that Hosokawa's CMC has a structure substantially identical to that as in Applicants' claim 1 and it would therefore have the claimed water solubility. Moreover, the Office alleges that it would have been obvious to have combined include the cellulose ether of Hosokawa as a retention aid in the paper of Matsuda in view of Hosokawa as a functionally equivalent option and to have a reasonable expectation of success. The Office also alleges that it would have been obvious to use the claimed cellulose ether as the disclosed carboxymethyl cellulose binder in the coating.

Applicants respectfully traverse the Office's rejection of independent claim 1 and submit claim 1 is patentable for at least the following reasons. Matsuda relates to an inkjet recording medium. As the Office has indicated, the recording medium has a coating formed on at least one surface of a substrate. As set forth in Matsuda, cellulose

derivates may be included “[a]s the binder of the coating layer. . . .” (Matsuda, at col. 5, lines 10-15).

Contrary to Matsuda, Applicants’ invention, as recited in claim 1, is directed to a paper comprising a filler content of above 20 wt% and a cellulose ether as specified in claim 1. Thus, the claimed paper comprises both a filler of the specified content and cellulose ether as specified. Accordingly, Applicants’ invention is distinguishable over Matsuda as nowhere does it appear Matsuda discloses or suggests that cellulose derivatives may be included in the paper substrate, but rather discloses such binders in a coating. In other words, Matsuda neither discloses nor suggests cellulose derivatives in the base paper sheet, but rather that such binders may be included in a binder coating layer that is a separate layer from the base paper sheet.

The Office alleges that “[a]bsent convincing evidence commensurate in scope with the claims, it would have been obvious to one of ordinary skill in the art to use the claimed cellulose ether as a retention aid in the paper of Matsuda in view of Hosokawa as a functionally equivalent option and to have a reasonable expectation of success.” (Office Action, page 4). Applicants submit that Matsuda generally discloses the use of cellulose derivatives as a binder in its coating layer, while exemplifying carboxymethyl cellulose, hydroxethyl cellulose and hydroxypropyl methyl cellulose. Here, even the exemplary celluloses encompass large numbers of possible CMCs. It is further noted that of these exemplary celluloses, claim 1 specifically states, “the cellulose ether is not a hydroxyethyl cellulose.” Accordingly, Applicants submit that the combination of Matsuda (cellulose derivative in the paper coating) and Hosokawa (cellulose ether) fails to establish a *prima facie* case of obviousness for including the combination of the claimed cellulose ether in the base paper having the claimed filler content with any reasonable expectation of success.

The Office also alleges that “[i]t would also have been obvious to use the claimed cellulose ether as the disclosed carboxymethyl cellulose binder in the coating.” (Office Action, page 4)(emphasis added). Applicants submit, however, that the Office has not established why one of ordinary skill in the art would have included the CMC of

Hosokawa in the paper substrate of Matsuda. Clearly, Matsuda does not suggest adding a CMC derivative, much less a cellulose ether, such as recited in Applicants' claim 1, to the base paper substrate. Contrary to the combined teachings of Matsuda and Hosokawa, the combination of features of Applicants' invention provides an improved retention of the filler and allows the highly filled paper to be produced more economically than conventional papers.

Furthermore, Applicants submit that the Office has also not established why one of ordinary skill in the art would have selected the specific cellulose ether of Hosokawa and included it in the coating of Matsuda in the first place. Merely the disclosure that cellulose derivatives could be included cannot establish that all cellulose derivatives are substitutable or that all would operate with a reasonable expectation of success. The Office merely concludes that it would have been obvious to one of ordinary skill in the art to use the "claimed" cellulose ether as a retention aid in the paper of Matsuda as a functionally equivalent option and to have had a reasonable expectation of success. However, what is not established is why one of ordinary skill in the art would have selected Hosokawa's cellulose ether from among any other cellulose derivative with a reasonable expectation of success. Clearly, Matsuda itself provides little if any guidance for selecting one cellulose derivative over another such that one of ordinary skill in the art would have had a reasonable expectation as to which one(s) would be successful in its paper coating. Applicants submit that without more to support its conclusion except for Applicants' own disclosure as a roadmap, the Office has not provided the requisite articulated reasoning with some rational underpinning to establish a *prima facie* case of obviousness.

Accordingly, Applicants submit, therefore, that the combination of Matsuda and Hosokawa fails to disclose or suggest Applicants' invention as recited in claim 1. The paper, as recited in claim 1, has an improved retention of the filler, thus having a filler content of above 20 wt% based on the total weight of the paper, which is higher than conventional papers. The combination of the cellulose ether and higher amount of filler content in the claimed paper allows the highly filled paper to be produced more

economically than conventional papers. The combination of Matsuda in view of Hosokawa as evidenced by Watanabe neither discloses, suggests nor hints to this.

Accordingly, for the above-discussed reasons, Applicants submit that the pending claim 1 is patentable. Claims 2, 5, 8, 9 and 14 are also patentable for at least the reasons that claim 1, from which they depend, is patentable, but may be separately patentable for additional reasons as well.

Response to Rejections based on Matsuda in view of Hosokawa and further in view of Ferguson

Claims 12, 13 and 15 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Matsuda in view of Hosokawa and further in view of U.S Patent No. 4,808,633 ("Ferguson"). The Office alleges the disclosures of Matsuda and Hosokawa as noted above, but acknowledges that they do not disclose the claimed papermaking steps. To supply these missing features, the Office relies on the disclosure of Ferguson. Specifically, the Office asserts that Ferguson discloses that paper is typically made by adding materials such as retention aids and fillers to an aqueous papermaking stock, draining water from the stock and drying the stock. (Office Action, page 5). The Office alleges that it would have been obvious to one of ordinary skill in the art to use the claimed steps to make the paper of Matsuda in view of Hosokawa and further in view of Ferguson as a typical papermaking process.

Applicants respectfully traverse the rejection and respectfully submit that claim 12 (and claims 13 and 15 dependent thereon) is patentable for at least the following reasons. Regarding the rejections based on the combination of Matsuda and Hosokawa, these are discussed above. The Office merely applies Ferguson as generally disclosing a typical papermaking process. Applicants submit that in making its rejection, Office has merely concluded that it would have been obvious to one of ordinary skill in the art to use the claimed process (as allegedly disclosed in Ferguson) to make the paper of Matsuda in view of Hosokawa. Ferguson fails, however, to disclose or suggest the method of making the paper as set forth in claim 1, either alone

or in combination with Matsuda and/or Hosokawa, as Ferguson fails to make up for the deficiencies of Matsuda and Hosokawa as noted above.

Applicants further note that Ferguson exemplifies only hydroxyethyl cellulose, which is specifically excluded from Applicants' claims. Accordingly, one of ordinary skill in the art, reading Ferguson as a whole, would not have relied on the teachings of Ferguson to arrive at Applicants' claimed invention, as this teaching in Ferguson leads away from Applicants' claimed invention.

Response to Rejections based on Agnemo in view of Hosokawa as evidenced by Smook

Claims 1, 2, 5, 8, 9 and 12-15 stand rejected as unpatentable over U.S. Patent No. 5,368,689 ("Agnemo") in view of Hosokawa and as evidenced by Smook (Handbook for Pulp and Paper Technologists). The Office asserts that Agnemo discloses paper comprising retention aids, fillers, a particular acid and a reduction agent. (Office Action, page 5). The Office further asserts that in some embodiments, Agnemo discloses a supercalendered paper having a filler content of about 20-30% by weight of the dry paper, and in other embodiments the paper is a fine paper comprising 5-30% filler by weight of the dry paper and an outermost layer comprising a surface size (reads on paper coating) or a coating layer. (Office Action, page 5). The Office acknowledges that Agnemo fails to disclose the claimed cellulose ether. The Office further applies Hosokawa as used above.

In combining Agnemo with Hosokawa, the Office alleges that "[a]bsent convincing evidence commensurate in scope with the claims, it would have been obvious to one of ordinary skill in the art to use the claimed cellulose ether as a retention aid in the paper of Agnemo in view of Hosokawa as a functionally equivalent option and to have a reasonable expectation of success." (Office Action, page 6). The Office alleges that it would also have been obvious to use the claimed cellulose ether as the disclosed surface size or coating. Alternatively, the Office alleges that common components of paper coatings include thickeners, such as cellulose derivatives and dispersants. The Office thus concludes that it would have been obvious to one of

ordinary skill in the art to use a coating having pigments, binder and other common components for the coating of fine paper and use the claimed cellulose ether as the disclosed carboxymethyl cellulose binder or as an adhesive, thickener or dispersant in the coating.

Applicants respectfully traverse the Office's rejection and submit that the claims patentable over these cited references for at least the following reasons. First, throughout the Office's rejection, reference is made to the use of cellulose derivatives as components in coatings for paper. Applicants submit that claims 1 and 12 are directed to a paper and a method of making paper, respectively. In each claim, the claimed cellulose ether is not included in a coating, but rather it is clear from each claim that the cellulose ether is in the base paper substrate. In contrast, Agnemo only discloses carboxymethyl cellulose at column 3, line 65, where the CMC is described as a coating agent. Accordingly, similar to Matsuda, there is no disclosure or suggestion in Agnemo of using cellulose ether, such as recited in Applicants' claims, in the base paper substrate.

Furthermore, Applicants submit that it is the Office's burden, not Applicants', to establish why it would have been obvious to have included the specific cellulose ether of Hosokawa in the paper coating of Agnemo. Here, Agnemo generally describes only carboxymethyl cellulose. Clearly not all retention aids, and not even all CMCs, are obvious substitutes such that one of ordinary skill in the art would have had a reasonable expectation of success as to which ones would work in the paper coating of Agnemo. For example, Agnemo is silent whether such CMCs are anionic, nonionic, amphoteric, cationic, hydrophobic, etc. It cannot be said that all such CMCs are therefore obvious substitutes for one another, without more. Accordingly, Applicants submit that without more to support its conclusion except for Applicants' own disclosure as a roadmap, the Office has not provided the requisite articulated reasoning with some rational underpinning to establish a *prima facie* case of obviousness.

Accordingly, for the above-discussed reasons, Applicants submit that the pending claim 1 is patentable. Claims 2, 5, 8, 9 and 12-15 are also patentable for at

least the reasons that claim 1, from which they depend, is patentable, but may be separately patentable for additional reasons as well.

Conclusion

In view of the amendments and arguments set forth above, Applicants respectfully submit that the pending application is in condition for allowance. Notice to this effect is earnestly solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "James C. Abruzzo". The signature is written in a cursive, flowing style.

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